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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------------|------------------------|
| 10/501,155 | 07/13/2004 | Koichiro Saga | SON-2563 | 5207 |
| 23353 7590 12/03/2007 RADER FISHMAN & GRAUER PLLC LION BUILDING 1233 20TH STREET N.W., SUITE 501 WASHINGTON, DC 20036 | | | EXAMINER WATSON, JOY L | |
| | | | ART UNIT 1792 | PAPER NUMBER |
| | | | MAIL DATE 12/03/2007 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|-------------------------------|--------------------------------|--|
| Office Action Summary | Application No. 10/501,155 | Applicant(s) SAGA, KOICHIRO | |
| | Examiner Joy Watson | Art Unit 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :July & Oct 2004,Jun 2005, May 2006, Aug 2007.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5, 15-17, 19, 22-24, 26, 29, 31-33, 35 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Vaartstra (US Patent 6,242,165 known hereafter as '165).

Claim 1, 29 and 33

'165 teaches treating a surface (a semiconductor) with a supercritical fluid where NH_3 is a co-solvent (col. 4 lines 29-57, col. 11 Claim 15).

Claim 15, 31 and 35

'165 teaches treating a surface (a semiconductor) with a supercritical fluid where ammonium fluoride is a co-solvent (col. 4 lines 29-57, col. 6 lines 11-23).

Claim 22, 32 and 36

'165 teaches treating a surface (a semiconductor) with a supercritical fluid where HF is a co-solvent (col. 4 lines 29-57, col. 6 lines 11-23).

Claim 2, 3, 16, 17, 23 and 24

'165 teaches the method according to Claim 1 and additionally teaches where the surface has a structural body and is a fine structural body with an electrode pattern (col. 4 lines 30-57).

Claim 5, 19 and 26

'165 teaches the method according to Claim 1 where the supercritical fluid is CO₂ (col. 4 lines 3-9).

3. Claims 8-14, 30 and 34 rejected under 35 U.S.C. 102(b) as being anticipated by Mullee (US Patent 6,306,564 known hereafter as '564).

Claim 8, 12, 30 and 34

'564 teaches a treating a surface (a semiconductor) with a supercritical fluid (CO₂) and diglycolamine (col. 2 lines 29-49, col. 5 claim 1).

Claim 9, 10 and 11

'564 teaches the method according to Claim 8 and additionally teaches that the surface has a structural body with an electrode pattern used for a photolithographic process (col. 2 lines 29-49).

Claims 13 and 14

'564 teaches the method according to Claim 8. Additionally '564 teaches using a supercritical fluid to treat a surface and adding a polar surfactant material (isopropanol) (col. 4 lines 12-35).

4. Claims 37-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Chandra et al. (US PG Pub 2002/0014257 known hereafter as '257).

Claim 37

'257 teaches a substrate treatment chamber (10), an opening to load and unload said substrate (paragraphs 69 and 102), a lid (30) for said opening with a seal (37) (paragraph 46), a fluid supply port within said treatment chamber and a fluid supply source (56) connected to said fluid supply port supplying a substance capable of forming a supercritical fluid (paragraph 56). Regarding the recitation "...[S]upplying a substance capable of having a form of supercritical fluid.", this recitation is a statement of intended use which does not patentably distinguish over '257 since '257 meets all the structural elements of the claim and is capable of "[S]upplying a substance capable of having a form of supercritical fluid" if so desired. See MPEP 2114.

Claim 38

'257 teaches the apparatus according to Claim 37 and additionally teaches a fluid supply source (56) (paragraph 56). "Capable of supplying said substance capable of

having a form of supercritical fluid in a gas form" is intended use language. It has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

Claim 39

'257 teaches the apparatus according to Claim 37 and additionally teaches a valve (54) for discharging said substance capable of having a form of supercritical fluid in said treatment chamber (paragraph 56). Regarding the recitation "...[F]or discharging said substance capable of having a form of supercritical fluid in said treatment chamber" is a recitation of intended use which does not patentably distinguish over '257 since '257 meets all the structural elements of the claim and is capable of "...[D]ischarging said substance capable of having a form of supercritical fluid in said treatment chamber."

Claim 40

'257 teaches the apparatus according to claim 39 and additionally teaches a discharge fluid separation device (126) connected to said valve (paragraph 56).

Claim 41

'257 teaches the apparatus according to Claim 40 and additionally teaches a heater (32 and 33) to heat said supercritical substance (paragraph 50).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 4, 6, 7, 18, 20, 21, 25, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over '165 as applied to claim 1 and 2 above, and further in view of Mullee (US Patent 6,306,564 known hereafter as '564).

Claim 4 and 18, 25

'165 teaches the method according to claim 2, but does not teach that the surface is a photomask utilized for lithography. '564 teaches using a supercritical fluid to treat the surface of photoresist used in a photolithographic process (col. 2 lines 29-49). That is, the method to treat a surface taught in '165 could be used to treat a surface of photoresist used in a photolithographic process as taught in '564. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method

taught in '165 to treat a surface of photoresist used in a photolithographic process as taught in '564. Using the known technique of treating a surface with supercritical fluid and NH_3 of '165 would have been obvious to one of ordinary skill in the art.

Claim 6 and 7, 20, 21, 27, 28

'165 teaches the method according to Claim 1, but does not teach that the supercritical fluid is further added with a polar surfactant material. '564 teaches using a supercritical fluid to treat a surface and adding a polar surfactant material (isopropanol) (col. 4 lines 12-35). It would have been obvious to one of ordinary skill in the art to use a polar surfactant material as taught in '564 in the surface treatment method taught by '165. Using the known technique of adding a polar surfactant material in treating a surface of '165 would have been obvious to one of ordinary skill in the art.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 6,277,753 and US PG Pub 20040091813.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy Watson whose telephone number is 571-270-1267. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Joseph L. Perrin/
Joseph L. Perrin, Ph.D.
Primary Examiner
Art Unit 1792

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